Manufacturing Process of a Teflon Dual-Direction Extending Film Filtration Nonwoven (II)

Background of the Invention

Teflon is known as a type of resin, its chemical name is polytetrafluoroethylene (PTFE), is formed by polymerizing tetrafluoroethylene (C2F4) to become polytetrafluoroethylene (PTFE). Teflon is composed by carbon and fluoride atoms and does not consist hydrogen, therefore it does not take any effect with oxygen. Teflon has characteristics of heat-resistant, low-temperature resistant, corrosion resistant, excellent non-adhesive and self-moistening, as well as low coefficient of friction. Teflon is relatively uneasy to mix with other chemical materials, so that it is hard for them to adhere on Teflon.

Teflon has the above-mentioned characteristics and is mainly applied in filtration materials. Fig. 1 is a conventional manufacturing process flow chart, firstly, make a net shape frame (10), place a carded cotton and a multi-layer flock or lint on the net shape frame (11), use needle-punching (12) to sew (10) and (11) together, apply thermo-heating to laminate the Teflon film and adhere-combining (13). A piece of conventional filtration nonwoven finished product is made. The disadvantage is that, the needling method is done randomly and cannot really fix the lint (11) and it may change position, which can affect the filtration effectiveness.

Summary of the Present Invention

The present invention of manufacturing process of a Teflon dual-direction extending film filtration nonwoven uses a Teflon dual-direction extending film, after it is splitted and become a fibrous structure, followed by inter-twisting to become yarn, and use a knitting machine to knit as a Teflon fabric. After raising on both sides, apply thermo-heating on one or two sides to laminate the Teflon dual direction extending film on the Teflon fabric, a filtration nonwoven is made. Roll the filtration nonwoven repeatedly to become a filtration cartridge or as a filter bag, a dust-collecting bag or a conveyor. Thus knitted Teflon fiber has the characteristics of having stably fixed position and can optimize its filtration effectiveness.

The present invention will become more fully understood by reference to the following detailed description thereof when read in conjunction with the attached drawings

Brief Description of the Drawing

Fig. 1 is a conventional manufacturing process flow chart of a filtration nonwoven;

Fig. 2 is a manufacturing process flow chart of a Teflon dual direction extending film filtration nonwoven of the present invention;

Fig. 3 is a perspective view of a flat knitting machine for the present invention of a Teflon dual direction extending film filtration nonwoven;

Fig. 4 is a view of a manufacturing process of a Teflon dual direction extending film filtration nonwoven made as a filtration material

of the present invention;

Fig. 5 is a view of a manufacturing process of a Teflon dual direction extending film filtration nonwoven made as a conveyor of the present invention;

Fig. 6 is a flat view of rapier weft-knitting method;

Fig. 7 is a flat view of air jet weft knitting method;

Fig. 8 is a flat view of water jet weft knitting method;

Fig. 9 is an enlarged sectional view of a Teflon dual direction extending film filtration nonwoven of the present invention and a conventional filtration nonwoven.

Detailed Description of the Preferred Embodiment

Referring to Fig. 2, which is a production flow chart of the present invention of manufacturing process of a Teflon dual-direction extending film filtration nonwoven. After a Teflon dual-direction extending film is splitted (20), and become a fibrous structure, followed by inter-twisting to become yarn (21), and use a knitting machine to knit as a Teflon fabric (22). After treated with raising on one or two sides of the Teflon fabric (23), apply thermo-heating on one or two sides to laminate and adhere-combine the Teflon dual-direction extending film (24), a filtration nonwoven is made. Roll the filtration nonwoven repeatedly to become a filtration material (25) or as a dust-collecting bag (27), or as a conveyor (26), or as a filter bag (28). To sum it up, use a splitting machine to split the Teflon dual-direction extending film to become a micro fibrous structure, the Teflon micro fibrous structure is then

inter-twisted to become Teflon yarn, the Teflon yarn is knitted by a knitting machine to become a Teflon fabric. After raising on the sides of the Teflon fabric, apply thermo-heating to laminate and adhere-combine the Teflon dual-direction extending film on the Teflon fabric to become a nonwoven.

The raising process or treatment mentioned above is done by a raising machine to make the structure of a fabric into many worsted extended outward.

After the inter-twisting process, the Teflon yarn is 200-20000 dtex (In the textile industry, dtex is a unit used in the SI –International System for measurement of density of fiber and filament. The weight of a unit length or the density of yarn uses tex as the basic measurement unit. If we let a unit tex of fiber or filament or yarn be T, then each 1000m will has a weight of Tg. This unit tex is very suitable for use in yarn, as for cellulosic fines, for yarn fiber for use in knitted fabric, decitex (dtex) is used instead to suit the density. That is, every 1000m is 0.1g, or every 10000m is 1g. dtex value of fiber or filament is approximately equal to the value of 9000m to 1g in denier.)

Fig. 3 is a perspective view of a flat knitting machine. A flat knitting machine (60) uses yarn (61) to knit as a Teflon fabric (62). There are 3 knitting methods, the first one is rapier weft-knitting method as referred to Fig. 6., the second one is air jet weft knitting method as referred to Fig. 7, and the third one

is water jet weft knitting method as referred to Fig. 8. The present invention mainly uses the water jet weft knitting method, the liquid inside a pump is accelerated to a nozzle (30), the ejected water then brings a weft (31) to a shed to finish weft projectile movement, thus a Teflon fabric (62) is made.

Thus the fabric has the characteristics of having stably fixed position with the yarn threads being interlaced with each other, and can optimize its filtration effectiveness.

Fig. 4 shows the present invention made as a filtration material, which is a cartridge. A filtration nowoven (40) is rolled repeatedly to form a filtration cartridge (41) or similar filtration material of same shape. The filtration cartridge (41) having a hole (42) disposed at its center, so that fluid or liquid needed to be filtrated can go through the hole (42) into the filtration cartridge (41), then comes out through the outer surface (43) of the filtration cartridge (41) to achieve the filtration purpose. Or vice versa, fluid or liquid can goes through the outer surface (43) first and then comes out from the hole (42) of the filtration cartridge (41), the same purpose of filtration is also achieved.

Referring to Fig. 5, which shows the present invention made as a conveyor. A plurality of the filtration nonwoven (40) is connected by a connector (51) to form a Teflon conveyor (52). The Teflon conveyor (52) having characteristics of

acid-resistant, alkali-resistant, heat-resistant, low temperature-resistant, corrosion-resistant, non-adhesive, self-moistening and with low coefficient of friction, which make it an excellent conveyor (52).

Referring to Fig. 9, an enlarged sectional view of a Teflon dual direction extending film filtration nonwoven of the present invention and a conventional filtration nonwoven. The conventional type having a nonwoven layer (14) being compact and not easy to let air through, after laminated with a layer of Teflon film (15) to become a filtration nonwoven (16) features very poor filtration characteristic. In comparison, the present invention uses inter-twisting and raising processes to make the finished product to become looser in structure. Thus a nonwoven layer (63) features excellent air-through and filtration characteristics, after laminated with a layer of Teflon film (64) to become a filtration nonwoven (40) features excellent filtration characteristic.

Note that the specification relating to the above embodiment should be construed as exemplary rather than as limitative of the present invention, with many variations and modifications being readily attainable by a person of average skill in the art without departing from the spirit or scope thereof as defined by the appended claims and their legal equivalents.